Portage Metropolitan Housing Authority

SECTION 13700 - DETECTION AND ALARM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Integrated Digital Alarm Communicator and Access Control System (DACS), including but not limited to the following:
   1. Control panel.
   2. Enclosures.
   3. Lock and key.
   4. Power Supplies.
   5. Accessories required to provide a complete DACS.
   6. System O and I manual.
   7. System programming.
   8. Batteries.
   9. Wiring.
   10. Conduits.

B. The Contractor shall be responsible for identifying requirements for low voltage permits from the local building department for the installation of the alarm system specified herein and shall assist the Owner in obtaining the relevant alarm permits. If low voltage permits are not required, the successful security contractor shall pay for a local Portage County Electrical Inspector to inspect all above ceiling work and certify that all wire supports and fire stopping meet the latest version of the NEC, and BOCA codes. A copy of this approved inspection form shall be provided with requires for final payment.

C. RELATED SECTIONS

Section 08710 - Door Hardware: Electric locks, alarm contacts and door opening monitoring devices.

Section 13703 - Access Control.

Section 16050 - Basic Electrical Methods and Materials: Intrusion detection systems Infrastructure.

Section 13800 - Building Automation and Control.

1.2 SYSTEM DESCRIPTION

A. A functionally complete, integrated Digital Alarm Communicator System (DACS) per manufacturer's guidelines, codes and specification requirements.
   1. The DACS shall include a Control Panel with built-in, supervised telephone line interface.
   2. The DACS shall include recording and retention of event information in a dedicated event log.
   3. The DACS shall incorporate an integral real-time clock, calendar, and a test timer.
   4. The DACS shall incorporate battery charging capabilities with supervision of battery voltage and battery leads.
   5. The DACS shall accommodate a time / event-based scheduling system.
   6. The DACS shall be capable of supervision of peripheral devices and communications interfaces.
   7. The DACS shall support the connection and reporting of intrusion, fire detection and access control devices to a remote Digital Alarm Communicator Receiver (DACR).
   8. The DACS shall accommodate configuration and operation of separate, independent areas.
   9. The DACS shall accommodate hard-wired or wireless point expansion via expansion point interface modules and RF receivers.
   10. The DACS shall have electrically supervised detection loops and power supplies with battery(s) maintenance. This supervision shall be programmable for the purposes of reporting this information to the DACR.
   11. The DACS shall be capable of monitoring and switching to active telephone lines when trying to establish communications with the DACR and transmitting a report.
   12. The DACS shall be capable of sending (manually or automatically) test and status reports to remote DACRs.
   13. The DACS shall be able to accommodate test, diagnostics, and configuration

programming functions locally or remotely via a portable programmer or a computer running the Remote Programming Software (RPS).

14. The DACS shall annunciate alarm, trouble, service reminders, and other relevant system status messages in custom English text at the ACC.

1.3 REFERENCES

A. National Electric Code, Article 760.

B. National Fire Alarm Code (NFPA 72).

C. Administrative Council for Terminal Attachments (ACTA):

1. ANSI/TIA-968-A-2002 Technical Requirements for Connection of Terminal Equipment to the Telephone Network.

D. American National Standards Institute (ANSI):

1. ANSI C63.4 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

E. California State Fire Marshal (CSFM):

1. Title 19, California Code of Regulations, Building Material Listing Program (BML).

F. Federal Communications Commission (FCC):

1. Title 47 C.F.R. Part 15; Class B - Radiated and Conducted Emissions.
2. Title 47 C.F.R. Part 68; rules governing the connection of Terminal Equipment (TE) to the Public Switched Telephone Network (PSTN).

G. The National Institute of Standards and Technology of the United States of America (NIST):

1. Federal Information Processing Standards Publications 197 (FIPS 197) -Advanced Encryption Standard (AES).

H. International Organization For Standardization (ISO):

1. 9001 - Quality System.

I. Underwriters Laboratories, Inc. (UL):

1. UL 50 - Enclosures for Electrical Equipment.
2. UL 294 - Access Control System Units.
3. UL 365 - Police Station Connected Burglar Alarm Units and Systems.
4. UL 609 - Local Burglar Alarm Units and Systems.
5. UL 864 - Control Units System for Fire-Protective Signaling System.
6. UL 985 - Household Fire Warning System Units.
7. UL 1023 - Household Burglar Alarm System Units.
8. UL 1076 - Proprietary Burglar Alarm Units and Systems
9. UL 1610 - Central Station Burglar-Alarm Units.
10. UL 60950-1 - Information Technology Equipment - Safety.
11. UL 636 - Hold up alarms

1.4 SUBMITTALS

A. Submit under provisions of submittal section of specifications Division One.

B. Product Data: Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete Digital Alarm Communicator and future 8 door Access Control System (DACS) for the main building and sub-panel for the garage. Including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Shop drawings shall provide details of proposed system and the work to be provided. Include point-to-point, reproducible CAD drawings of systems and wiring diagrams of individual devices.

1. Detailed wiring diagrams and system description.
2. System device locations on architectural floor plans.
3. Full Schematic of system, including wiring information for all devices.

D. Documentation to be submitted by the Contractor upon completion of system installation:

1. "As-build": Upon completion of installation, the Contractor shall prepare "as-built" drawings of the system. These "As-builds" shall be 30 inches by 42 inches (76 cm by 107 cm) format Two complete paper sets shall be provided and one CD containing all of the reproducible drawings, in PDF or DWG format. These drawings shall indicate complete plans indicating exact device locations, panel terminations, and panel point numbers.

a. Additionally, final point-to-point wiring diagrams of each type of device (on 30

inches by 42 inches (76 cm by 107 cm) format) shall be included in the "as-build."

b. "As builds" shall be submitted to the Owner for approval prior to the system acceptance walk-through. Operation and maintenance manuals: Three sets of operating manuals shall be provided explaining the operation and maintenance of the system

1.5 QUALITY ASSURANCE

A. Manufacturer Qualification:
   1. The system shall be the standard product of one manufacturer, and the manufacturer shall have been in business manufacturing similar products for at least 5 years.
   2. Manufacturer's Quality System: Registered to ISO 9001:2000 Quality Standard.

B. Installer Qualification:
   1. Minimum of ten years' experience installing access control, surveillance and security systems and future integrated software.
   2. After-sales support: The Contractor shall be a factory-authorized and trained dealer of the system and shall be a factory-trained and certified BCSD dealer to install/maintain/repair the system after system acceptance.

C. System Requirements:
   1. All equipment, systems, and materials furnished and installed under this section shall be installed in accordance with the applicable standards of:
      a. National Codes: NEC, NFPA, UBC, BOCA, SBCCI, IBC as applicable.
      b. Approvals and listings: UL, FM, ANSI SIA CP-01, CSFM, NYC-CoA, as applicable.
      c. Local Authorities Having Jurisdiction (AHJ).

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened, undamaged containers; and unharmed original identification labels.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Protect store materials from environmental and temperature conditions following manufacturer's instructions.

D. Handle and operate products and systems according to manufacturer's instructions.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. All components, parts, and assemblies supplied by the manufacturers and installed by the Contractor shall be warranted against defects in material and workmanship for a period of at least 12 months (parts and labor), commencing upon date of acceptance by Owner. A qualified factory-trained service representative shall provide warranty service.

B. Service/Maintenance:
   1. System maintenance and repair of system or workmanship defects during the warranty period shall be provided by the Contractor free of charge (parts and labor).
   2. Periodic testing of the system shall be carried out on a monthly or quarterly basis, by the owner to ensure the integrity of the control panel, the sensing devices, and the telephone lines.
   3. The installer shall correct any system defect within six hours of receipt of call from the Owner. 24hours per day, 365 days per year.
   4. Extended service/maintenance agreements shall be offered by the Contractor for up to four years after the warranty expires. The agreement shall be renewable yearly.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Bosch Security Systems, Inc.

2.2 GENERAL DESCRIPTION

A. Control Panel and Features:
   1. The DACS control panel shall be Bosch Security Systems, Inc. model D9412GV4 comprising a fully integrated intrusion, fire, and access control system. D7412GV4 for the garage. Specifications for the main building. Specifications for the garage panel

not listed other than model number. The control panel shall support the following:

a. The DACS system is capable of being utilized as a combination Intrusion and Fire system per code. Fully integrated intrusion, access and fire functions allow users to interface with 1 system instead of 3
b. Integrated Telephone Line Interface with programmable options for signaling and supervision.
c. Conettix IP based communication option provides high-speed, secures alarm transport and control.
d. 32 programmable areas with perimeter and interior partitioning.
e. 8 on-board, class B hardwired points with expansion capability for a total of 246 wired or wireless points.
f. Compatibility with touch-screen color LCD, vacuum fluorescent, ATM style LCD or LED style Alarm Command Centers.
g. Local or remote programming, test, and diagnostic capability via a computer running the Remote Programming Software (RPS).
h. The system shall support the use of an Apple iOS device for control. Functions to include arming, disarming, control of outputs, lock, unlock, cycle and secure access doors.
i. Integrated real time clock, calendar, test timer and programmable scheduling capability for relay control and automatic execution of system functions based on a time / event.
j. Provide 1.4 amps of power for standby operation and 2 amps of alarm power, both rated at 12 VDC.
k. 2 wet-contact relay outputs and 1 Auxiliary wet-contact relay output with expansion capability for up to an additional 128 dry-contact relay outputs.
l. Integrated battery charger with reverse hook up protection, battery supervision and battery deep discharge protection.
m. Supervision of peripheral devices and communications interface(s).

B. Point Functionality and Expansion:

1. Each point in the system shall be programmable to provide the following type of response in the system:
   a. Always on (24 hour response).
   b. On when the system is Master Armed.
   c. Only on when the system is Perimeter Armed.
   d. Displays / Does Not Display at the ACC when the point is activated.
   e. Provides / Does Not provide entry warning tone.
   f. Sounds / Does Not Sound audible alarm indication.
   g. The Point is by passable / not by passable.
   h. Alarm Verification with programmable verification time.
   i. Relay activation by Point.
   j. Provides / Does Not Provide "watch point" capability.
   k. Provides Swinger Bypass.
   l. Defers Bypass Report.
   m. Can return to the system after being force armed and then restoring.
   n. Can return to the system after being bypassed and then restoring.
2. The DACS shall be capable of supporting "group zoning." Group zoning refers to the combining of points into a separately identifiable and separately annunciated (programmable text) areas.
3. The DACS shall be capable of allowing variable point response times via programming. Point response times shall be programmable over a range of 300 milliseconds to 4.5 seconds.
4. The DACS shall have the capability to expand up to 246 separately identifiable points, of which 8 are on-board and 238 are off-board wired or wireless addressable points connected to multiplexed backbone trunks via wired modules and/or wireless receivers.
   a. The 8 on-board points shall be able to accommodate powered class B functionality using a powered loop interface module.
   b. Point Expansion Modules (Wired and Wireless) shall be able to be located remote to the main panel to a maximum distance of 1000 feet.

5. The DACS shall have the capability to expand up to 75 separately identifiable points, of which 8 are on-board and 67 are off-board addressable points connected to multiplexed backbone trunks via wired modules and/or wireless receivers.
    a. The 8 on-board points shall be able to accommodate powered class B functionality using a powered loop interface module.
    b. Point Expansion Modules (Wired and Wireless) shall be able to be located remote to the main panel to a maximum distance of 1000 feet.
6. Capability to expand up to 40 separately identifiable points, of which 8 are on-board and 32 are off-board addressable points connected to multiplexed backbone trunks via wired modules and/or wireless receivers.
    a. The 8 on-board points shall be able to accommodate powered class B functionality using a powered loop interface module.
    b. Point Expansion Modules (Wired and Wireless) shall be able to be located remote to the main panel to a maximum distance of 1000 feet.
7. Capability to expand up to 40 separately-identifiable points of which 8 are on-board points and 32 are off-board addressable points connected to point expansion modules and/or wireless receivers.
8. Capability to expand up to 24 separately-identifiable points of which 8 are on-board points and 16 are off-board addressable points connected to point expansion modules and/or wireless receivers

C. Areas/Accounts:
1. The DACS shall support 32 independent areas. Each of the 32 areas shall have custom text associated with the armed state, disarmed state and point-off-normal state.
2. The DACS shall support 8 independent areas. Each of the 8 areas shall have custom text associated with the armed state, disarmed state and point-off-normal state.
3. The DACS shall support 4 independent areas. Each of the 4 areas shall have custom text associated with the armed state, disarmed state and point-off-normal state.
4. The DACS shall support 4 independent areas. Each of the 4 areas shall have custom text associated with the armed state, disarmed state and point-off-normal state.
5. The DACS shall support 2 independent areas. Each of the 2 areas shall have custom text associated with the armed state, disarmed state and point-off-normal state.
6. The DACS shall be capable of assigning 1 to 32 account identifiers to the areas depending on the distribution of areas per account.
7. The DACS shall be capable of assigning 1 to 8 account identifiers to the areas depending on the distribution of areas per account.
8. The DACS shall be capable of assigning 1 to 4 account identifiers to the areas depending on the distribution of areas per account.
9. The DACS shall be capable of assigning 1 to 4 account identifiers to the areas depending on the distribution of areas per account.
10. The DACS shall be capable of assigning 1 to 2 account identifiers to the areas depending on the distribution of areas per account.
11. All of the areas must be capable of Master (All) and/or Perimeter (Part) arming (excluding predefined Interior protection).
12. The DACS shall be capable of logically grouping 1 or more points into an area, or conversely, dividing 2 or more points into two or more areas.
13. Any area shall be configurable to allow arming by specific users when a programmable number of devices are faulted or bypassed.
14. Areas shall be independently controlled by their corresponding ACC.
15. Area(s) shall accommodate assignment of independent account numbers to define annunciation, control, and reporting functions.
16. The DACS shall be capable of linking multiple areas to a shared area which may be automatically controlled (hallway or lobby).
17. The DACS shall accommodate conditional area arming dependent on the state of other areas (master or associate). Any area can be configured for perimeter and interior arming, not requiring a separate area for this function.

D. Output Relay Expansion: The DACS shall provide the capability for output relay expansion using relay expansion modules. Independent control of relay functions by area shall be possible through programming assignments.

1. The DACS shall be capable of activating 128 additional relay outputs for auxiliary functions based on its classifications (area vs. panel wide). Output Expansion Modules shall be able to be located remote to the main panel to a maximum distance of 1000 feet. 8 relays (Form C) are to be provided per octo-relay module
2. The DACS shall be capable of activating 64 additional relay outputs for auxiliary functions based on its classifications (area vs. panel wide). Output Expansion Modules shall be able to be located remote to the main panel to a maximum distance of 1000 feet. 8 relays (Form C) are to be provided per octo-relay module
3. The DACS shall be capable of activating 24 additional relay outputs for auxiliary functions based on its classifications (area vs. panel wide). Output Expansion Modules shall be able to be located remote to the main panel to a maximum distance of 1000 feet. 8 relays (Form C) are to be provided per octo-relay module
4. The DACS shall be capable of activating 16 additional relay outputs for auxiliary functions based on its classifications (area vs. panel wide). 8 relays (Form C) are to be provided per octo-relay module
5. The DACS shall be capable of activating 8 additional relay outputs for auxiliary functions based on its classifications (area vs. panel wide). 8 relays (Form C) are to be provided per octo-relay module
6. The DACS shall be capable of controlling relays and automatically executing system functions based on a time / event scheduling program. The program can be hour, day of week or day of month based.
7. Relays and other outputs may be programmed to follow up to 14 different area conditions or up to 12 panel conditions. Relays may also be programmed to follow individual points or groups of points.
8. The DACS shall support 4 different types of alarm output selections: Steady, Pulsed, California Standard, and Temporal Code 3.

E. Scheduling: The DACS shall support scheduling capabilities with the following characteristics:
1. Arm / Disarm specific area(s) based on open/close windows.
2. Bypass / Unbypass point(s).
3. Activate / Deactivate relay(s).
4. Send test reports.
5. Up to 4 programmable holiday schedules of 366 days each (includes leap year). Based on the holiday settings, different time windows for open/close and other system functions can be executed.
6. Automatic adjustment of system clock for daylight savings time.
7. Turn an Access Authority Level On / Off.
8. Hold a Door Open (unlocked and shunted).
9. Secure a Door Closed (locked, no valid cards will allow entry).
10. Return a Door to Normal Operation (locked, valid cards will allow entry).
11. Turn recording of Access Granted events On/ Off (and transmittal if routing is ON).
12. Turn recording of Access Denied events On/ Off (and transmittal if routing is ON).

F. Alarm Command Centers:

1. The DACS shall accommodate connection with up to 32 ACCs, each capable of displaying custom English text on touch screen liquid crystal or vacuum fluorescent (VF) displays.
2. The Alarm Command Centers shall accommodate viewing and configuration of system parameters including:
    a. Network Parameters:
        1) DHCP Enable/Disable for the selected network module.
        2) UPnP Enable/Disable for the selected network module.
        3) IP Address for the selected network module
        4) Subnet Mask for the selected network module.
        5) Default Gateway for the selected network module.
        6) Port Number for the selected network module - The module's port number shall range from 0 to 65,535.
        7) DNS Server Address for the selected module's DNS server IP address
        8) DNS Host Name for the selected module. The DNS host name shall

contain up to 63 characters.

9) AES Encryption Key Size - Enable/Disable encryption by selecting the AES encryption key size for the selected network module.

10) AES Encryption Key String - The user shall be able to display, add and modify the AES encryption string based upon the key size previously configured for the selected network module.

b. Point Parameters:

1) Point Selection between one and the maximum number of points in the control panel.

2) Point Registration to allow system response from a specific physical point on any one of the expansion modules; On-board, Point expansion modules (wired or wireless), and Access.

3) Wireless points shall be able to be enrolled in the system via an auto learn feature.

c. Event Routing Parameters to allow programming of up to 4 report routing groups as well as configuration of primary and secondary paths.

3. The DACS shall accommodate connection with up to 8 ACCs, each capable of displaying custom English text on liquid crystal or vacuum fluorescent (VF) displays.
4. The ACC's shall be capable of displaying point status, arm/disarm status, and carry out user command functions.
5. The ACC can be programmed to respond to the entry of any of the specifically authorized user passcodes.
6. The ACCs shall be able to be configured to control a specific area, or group of areas, or all areas in the system.
7. The ACCs shall be able to be temporarily re-addressed to view the status of a remote area.
8. The ACC's shall be able to provide different audible tones for Intrusion, Fire alarms, and system troubles

G. User Passcodes and Authority: Passcodes shall be programmable with authority levels to allow users to operate any or all areas.

1. Up to 999 different passcodes shall be accommodated.
2. Up to 399 different passcodes shall be accommodated.
3. Up to 99 different passcodes shall be accommodated
4. Up to 32 different passcodes shall be accommodated.
5. Each passcode shall be 3 to 6 digits (variable) and be assigned a 16-character user name that shall be printed on the local printer and DACR with associated opening and closing reports from the user.
6. Each passcode shall be 3 to 7 digits (variable).
7. User access to System features and functions shall be configurable based on 14 individually programmable levels of authority assigned to the user passcode. Additionally, the system shall have the capability to assign to the user passcode, a different authority level in each of the areas. A service passcode can be assigned to the servicing agent allowing the agent limited access to system functions. User-programmable / activated functions include:

a Arming the system: All areas, specific area(s) only, perimeter instant, perimeter delayed, perimeter partial, watch mode, and arming the system with a duress passcode.

b. Disarming the system: All areas, specific area(s) only and disarming with a duress passcode.

c. Viewing system status: Faulted points, event memory, bypassed points, area status and point status.

d. Implementation functions: Bypass a point, unbypass a point, and reset sensors, silence bell, activating relays, initiating the remote programming function locally to allow programming the system from a remote location.

e. Testing the system: Local Walk test, Service Walk test, Fire test, send report to remote DACR to check the telephone link, and programming the time and date for the next test report transmission.

f. Change system parameters: ACC display brightness, system time and date, and add/delete/change passcodes.

g. Extend the closing time of the system.
h. Transmitting special alerts and activating audible and visible signals.
i. Executing multiple commands / ACC keystrokes from a single Menu / Command List item. This function shall be able to have a 16 character (alphanumeric) title to identify it on the ACC display.
j. Editing of time / event based scheduling program from the ACC.
k. The DACS shall also provide a "service menu" to implement functions such as viewing and printing the system log, displaying the system firmware revision number, and defaulting (toggling) text displays between custom and default text displays for troubleshooting.

8. The DACS shall allow users to change their own user passcode from the Alarm Command Center (ACC). Managers shall be capable of changing the user passcodes and authority assignments by area of other users from the ACC.
9. The DACS shall incorporate a programmable "Passcode Follows Scope" feature to allow users to arm or disarm only the area they are entering with one simple command or control all areas from one ACC.
10. Passcodes shall be able to be associated with a unique access card/token. The authority of the card assigned to the user will equal that of the user, and each card will report in the display, local printer, memory event log and at the DACR as a unique, individual, user.

H. Access Control: THE DACS shall support access control using the D9210C access control module(s).

1. DACS shall support up to 8 D9210C door control modules to control 8 doors. Each door controller shall be capable of being programmed through the DACS from the local programmer or the RPS.
2. The DACS shall support up to 4 D9210C door control modules to control 2 doors. One D9210C shall be supplied and connected to the security panel.
3. The DACS shall use 26 bits of card/token specific data to identify the user. The card data shall not be truncated or shortened in making the identification of the user.
4. The access control module shall be able to be configured independently from the other doors. Door controllers shall include the following features and functions:
   a. Supervised, wired connection to normally open or normally closed contacts.
   b. 14 programmable levels of access authority
   c. Programmable entry/exit door strike and shunt control. The door opening can terminate a programmable door buzzer. The door contact is shunted when valid access is being granted through the door.
   d. A request to exit and a separate request to enter supervised input. A programmable feature provides for door shunting on request to exit without activating the lock output.
   e. Buzzer output that can be programmed to activate if the door is held open beyond a programmable time. Additionally, the ACC can display a door closing warning.
   f. The door can be programmed to activate an alarm or trouble in the door left open condition. The DACS shall be capable of transmitting the Door Left Open indication to the DACR.
   g. The door strike shall be capable of being programmed to automatically unlock if the area is completely disarmed and will not automatically unlock if the area is selectively disarmed.
5. The DACS shall be capable of being programmed, on a time basis, to record access granted and or access denied events by door.
6. The DACS shall allow each authority profile to specify whether users holding that authority are to be granted access into the area based on whether the area is completely disarmed, perimeter armed or completely armed.
7. The DACS shall be able to automatically disarm the area or convert the arm state of the area from fully armed to perimeter armed based on the authority level assigned to the user and area or arm an area from a particular reader.
8. Assigned users shall be able to manually control the door from an ACC by setting the door to Normal Operation, Manually Locked or Secured (valid cards will not operate).
9. The DACS shall log access control events and accommodate programming capability

for transmission of the events to primary and/or secondary DACRs, including door and user identity.

I. Communication: The DACS shall be capable of reporting system events and supervisory reports including alarm, trouble, missing modules, restorals, system status, AC failure, battery status to primary and secondary off-site DACR's. The following features shall be supported.

1. The DACS shall be capable of communicating via dial-up analog telephone lines, over a LAN/WAN/Internet using a wired network interface module If a LAN/WAN Internet Interface is used, the security contractor shall obtain a letter from the local Cable Company indicating there complete system is battery backed, and how many hours of uninterruptable service can be provided, or over a cellular network using a GSM/GPRS interface module.
2. See paragraph on above The DACS shall be capable of communicating via dial-up analog telephone lines, over a LAN/WAN/Internet using a wired dialer capture network interface module.

Note: The Bosch ModemIIIa² communications format shall be utilized for optimum system performance. The ModemIIIa² format provides the maximum data information to the receiver for alarms, troubles, restorals, bypasses, relay activation, opening/closings, and card access. The detailed information includes the point numbers with text, peripheral device numbers, user numbers with text, and area information.

3. The DACS shall have the capability of communicating with up to 8 different DACRs using up to 4 different phone numbers, up to 24-digits in length and/or 4 URL/IP addresses over a network.
4. The DACS shall have the capability of communicating with up to 5 different DACRs using up to 4 different phone numbers, up to 32-digits in length or 1 IP address using a dialer capture network interface module.
5. The DACS shall support 2 telephone lines using a dual phone line module. The lines shall be capable of being alternated for the transmission of consecutive events.
6. The DACS shall report to a Commercial Central Station that is using a Bosch D6600 Receiver/Gateway or a Bosch D6100i Receiver using ModemIIIa format and be connected to PMHA's existing central station, Emergency 24, Chicago allowing for the naming of each point for dispatch. The DACR shall provide the transmission information sent from the DACS that includes alarms, troubles, restorals, bypasses, relay activation, opening/closings, and card access. When using the ModemIIIa² format the detailed information includes the point numbers with text, peripheral device numbers, user numbers with text, and area information.
7. The DACS reports shall be classified, by event, into eleven subcategories or "report groups." Each group represents similar types of events. Individual events within each group shall be selectively enabled or disabled for transmission. The eleven report groups shall be as follows:
   a. Fire Reports.
   b. Burglar Reports.
   c. User Reports.
   d. Test Reports.
   e. Diagnostic Reports.
   f. Relay Reports.
   g. Auto Function Reports.
   h. RPS Reports.
   i. Point Reports.
   j. User Change Reports.
   k. Access Reports.
8. The DACS shall be capable of listening to the telephone line when calls are answered by other devices on the premises side of the phone line and determining if a special tone is being sent from RPS (Remote Programming Software) and intercepting the call for RPS Sessions.
9. The DACS shall be have the capability to verify the integrity of the remote communications path and switch to alternate paths when a communications failure occurs.
10. The DACS shall be capable of unattended mode of operation whereby programming

and configuration updates are automatically transferred using the Remote Programming Software (RPS). These updates can initiate from either the control panel or the remote computer using RPS.

J. Network Communication: The DACS shall be capable of network communications over a LAN, WAN, Intranet, or the Internet. The system shall include supervision of the network communication utilizing configurable periodic heartbeats to the Digital Alarm Communications Receiver (DACR). The DACR shall provide notification of the loss of communications from a networked system after a programmable timeframe since the last communication. The notification options shall be programmable and include local annunciation or indication to automation software.
   1. The network interface module shall be capable of supporting Dynamic Host Communication Protocol (DHCP) to obtain an IP Address.
   2. The system shall support a method of authentication between the control panel and the receiver to ensure that the control panel has not been compromised or replaced.
   3. The network interface modules shall be capable of supporting encryption using a minimum of 128-bit AES Encryption (Rijndael) certified by NIST (National Institute of Standards and Technology).
   4. The network interface modules shall support a 10/100BaseT connection to an Ethernet network.
   5. The control panel shall be capable of network communication with a programmable poll time to send periodic heartbeats to the receiver, programmable ACK Wait time, and programmable retry time. In the situation where a communication path is unsuccessful, the control panel shall be capable of attempting backup communication through an available communication method to the same receiver or a backup receiver.
      a. The control panel shall have the ability to automatically adjust the heartbeat rate of a backup path that is using GPRS to the heartbeat rate of the primary path in case of a primary path failure. Upon restoral of the primary path, the heartbeat rate of the backup path shall automatically restore to the original rate. This allows a system utilizing GPRS communications to keep the wireless charges low.
      b. The network communication between the control panel and the receiver shall use ModemIIIa².
      c. The control panel shall be capable of two-way communication using a wired network interface module with a 10/100BaseT on a LAN/WAN/Internet configuration or with a wireless GPRS module on the Internet.
      d. The control panel shall be capable of configuring the destination of the receiver using a URL or static IP Address.
      e. The control panel shall be capable of using DNS to lookup the IP Address of the receiver when programmed with a URL.
      f. The control panel shall support UPnP for automated Port Forward configuration in the router where the control panel is installed.
      g. The control panel shall support AutoIP to enable the RPS software to connect to the control panel locally using an IP Direct connection.
      h. The control panel shall support configuration of the IP parameters from the keypad eliminating the need for a PC to configure the IP device.
      i. The control panel shall support network diagnostics from a keypad to allow local testing of network connectivity. The diagnostics should include, Ethernet cable connected, gateway configuration ok, DNS lookup operational, and external network connectivity (such as the Internet) operational.
      j. The system shall be capable of meeting DCID 6/9 and UL 2050 standards.
   6. The system shall use a Dialer Capture Network Module (C900V2) to convert standard PSTN communications to send the messages to the receiver using the IP network.
      a. The Dialer Capture Network Module enables IP communications from the PSTN based DACS to the receiver using an IP network.
      b. The Dialer Capture Network Module shall include supervision of the network communication utilizing periodic heartbeats to the Digital Alarm Communications Receiver (DACR). The DACR shall provide notification of the loss of communications from a networked system after a programmable

timeframe since the last communication.

K. Event Log: The DACS shall maintain a log of events indicating time, day, month, year type of event, account number, area number, user ID, point text, user text and primary/secondary event route. The system shall allow the following characteristics:
   1. The DACS shall be capable of storing up to 1000 events
   2. The DACS shall support the printing of these events on up to 3 local printers.
   3. The DACS shall support the printing of these events on a local printer.
   4. The DACS shall support viewing of logs locally at the ACC and remotely via an upload to a remote central station computer running the RPS software.
   5. The DACS shall provide notification via a report to the DACR when the event log reaches a programmable "percent full capacity". This allows retrieval of stored events via RPS to prevent any loss of event history.
   6. Group, signal type and area can route events to specific printers.
   7. Each DACR shall be designated as a primary, backup, or duplicate destination for each report group. Assigning an event to multiple routing groups provides for duplicate destinations for the event. The transmission of grouped events allows the reporting of different types of information to different remote DACRs.

L. Testing, Diagnostic, and Programming Facilities: The DACS shall be capable of sending (manually or automatically) test and status reports to remote DACRs.
   1. The DACS shall be capable of sending automatic tests daily, weekly or once every 28 days. Automatic test times shall be programmable to provide an offset of up to 24 hours from the current time.
   2. Automatic test reports shall be programmable to be deferred by one test interval if any other report is transmitted in the current interval.
   3. Automatic test reports and remote system access for diagnostics shall be supported via a remote central station computer with Remote Programming Software (RPS).
   4. The DACS shall be programmable locally or remotely. Programming shall be accomplished via a command center or a computer with a remote programmer and diagnostic software package (RPS).
   5. The DACS shall allow an on-site user to initiate remote programming while on-line with the servicing location. The remote programming device must provide a compare feature and allow for downloading either the stored program or the (un)modified program copied from the panel.
   6. The DACS shall allow the local programming option to be disabled and must provide a method to program a panel while no one is on premises, when the panel shares a line with an answering machine.
   7. The DACS shall accommodate IP Diagnostic to verify settings and operation of the network interface modules; Host name, MAC address, IPV4 address assignment. The IP Connection test shall include; Link test to verify physical cable integrity, Ping test to verify gateway response, ping test to verify address on the internet.
   8. Wireless point diagnostics shall include signal strength and device states of registered wireless points in the system.
   9. The number of system testing and programming sessions shall be restricted via the use of program locking features and passwords. Passcode protection in excess of sixteen million combinations is required.
   10. New modules support enhanced diagnostics through RPS

M. Miscellaneous Features: Programmable alarm output timer, 31 programmable entry delay times, exit delay programmable by area, individually programmable point of protection text, point bypassing, key switch arming capability with LED outputs, and fire verification.

N. False Alarm Reduction: The DACS shall comply with all ANSI SIA CP-01 requirements for false alarm reduction

O. Ambush Detection: The DACS shall include an early ambush feature that requires that the user disarm, and then inspect the facility within a specified time period, before entering their passcode or a different authorized passcode again. If the user does not enter a passcode a second time, a duress event is generated. If the user does enter a passcode within the specified time period, the system disarms.

P. Two man rule: The DACS shall include a programmable feature that requires 2 separate passcodes to be entered to disarm the system. After 1 passcode is entered, the system will prompt for a second passcode to be entered on the same ACC. Without the second

passcode, the system shall not disarm.

Q. User-Programmable Features: The DACS shall provide a menu driven interface to provide a user-friendly command structure for programming / customizing the system to the operational criteria of the application. The DACS shall be capable of being operated via:
   1. The Command Structure.
   2. Menu / Command List.

2.3 SYSTEM INTERFACE REQUIREMENTS

A. Grounding: The Contractor shall properly earth ground the DACS to prevent electrostatic charges and other transient electrical surges from damaging the DACS panel.

B. Primary power: The Contractor shall provide a dedicated 120 VAC power circuit to the DACS system. This circuit shall be connected to the emergency power system. The 120 VAC is stepped down to power the DACS panel using a class two, plug-in transformer. This power circuit shall be properly rated to continuously power all points and functions indefinitely in full alarm condition.

C. Primary power supervision: When the primary power source fails, the system can be configured to report an "AC Fail" message to a commercial central station.
   1. The message can also be programmed to "tag-along" with another message transmitted to the central station.
   2. The system will always display a loss of primary power on the ACC and may be configured to provide additional audible warning.
   3. The transmission delay of this message is programmable from 5 seconds to 86 minutes with an optional 6 to 12 hour transmission delay

D. Secondary power (standby battery): The Contractor shall provide adequate battery power as defined by the relevant application criteria, (UL 864 and UL 985 for alarm installations or NFPA 72 chapters for fire applications). Appropriate battery chargers shall be provided consistent with the battery back-up capacity. The most current accepted version of NFPA 72 and any applicable local codes or AHJ requirements must be met accordingly.

E. Secondary power supervision: When the secondary power source experiences a 85 percent depletion of its standby capacity, the system can be configured to report a "Low Battery" message to a commercial central station. The system will always display a low battery condition on the ACC and may be configured to provide additional audible warning.

F. Telephone interface: The control panel in the DACS shall be equipped with a phone line monitor and shall interface with the phone lines via RJ-31X jacks for supervision of the telephone line connection.
   1. The telephone line interface shall conform with FCC rules (Title 47 C.F.R. part 68).
   2. When a telephone line is determined to be out of service by the DACS panel, the event will be annunciated locally on the ACC and transmitted to the central station over the alternate communications interface. The transmission delay of this message is programmable from ten to two-hundred forty seconds.
   3. When a telephone line is determined to be out of service by the DACS panel, the event will be annunciated locally based on programming options
   4. A telephone line switching module shall be used to interface to a second telephone line.

G. Ethernet Interface: The DACS may use an Ethernet interface module as the primary, or back-up means of communicating to a DACR.
   1. Built-in IP-based alarm transport, programming, and control
   2. The module shall accommodate 128-bit AES encryption.
   3. 10BASE T or 100BASE T network connection
   4. Full-duplex and half-duplex support

H. GSM/GPRS interface: The DACS may use an GSM/GPRS radio module as the primary, or backup, means of communicating to a DACR. Up to 4 IP Addresses shall be available for routing system events. The supervision time shall be programmable with a range of 5 to 65,535 seconds. This module shall accommodate 128-bit AES encryption.

I. Auxiliary function control interfaces: The DACS shall accommodate auxiliary functions such as activating bells, strobes, or lights and shall be accomplished using the optional application specific relay modules. These auxiliary interfaces shall be electrically isolated to avoid inter-system interferences or damage to the system.

J. Wiring: The contractor shall provide cables consistent with the manufacturer's recommendations. The following general guidelines shall be followed for wiring installation:

1. Wiring shall be appropriately color-coded with Copper conductors shall be used.
2. All signal cables provided under this contract shall be Class II, plenum-rated cable where required. Where subject to mechanical damage, wiring shall be enclosed in metal conduits or surface metallic raceway.
3. Data wires shall not be enclosed in conduit or raceways containing AC power wires.
4. Where EMI may interfere with the proper operation of the DACS circuits, twisted/shielded cable shall be used.

K. Environmental Conditions: The DACS shall be designed to meet the following environmental conditions:
1. The system shall be designed for a storage temperature of -10° C to 70°C (14° F to 158°F).
2. The system shall be designed for an operating temperature of 0° C to 50°C (32° F to 120°F).
3. The system shall be designed for normal operation in an 85% relative humidity environment.
4. The system shall meet or exceed the requirements of FCC rules Title 47 C.F.R. Part 15, Class B devices, and Part 68, IEC EMC directive

2.4 ACCESSORIES

A. System Accessories:: See 3.6.A
1. Intrusion System Accessory: Model - Per specifications
2. Fire System Accessory: Model - Per specifications
3. Access System Accessory: Model - Per Specifications
4. Closed Circuit Surveillance System - Per Specifications

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
B. Do not begin installation until unacceptable conditions are corrected.
C. If preparation is the responsibility of another installer, notify architect of unsatisfactory preparation before proceeding.
D. Ensure selected location is secure and offers protection from accidental damage.
E. Location shall provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.
F. Ensure power source is protected against accidental shutoff.
G. Install all equipment and materials in accordance with the "current" recommendations of the manufacturer. The work shall also be in accordance with:
1. Installation criteria defined in these specifications and in the construction documents.
2. Factory Representative can be the Bosch Security Systems Inc Security Dealer.
3. Approved submittals.
4. Applicable requirements of referenced standards.

H. The contractor shall provide the following services as part of the contract:
1. Sub-contract installation not allowed.
2. Coordination of other contractors for system-related work (electrical contractor, finish hardware contractor, architect, and general contractor).
3. Attending site construction/coordination meetings.
4. Keeping updated construction drawings at the construction site.
5. Meeting construction deadlines per the construction schedule.

I. Programming of the system shall include the following tasks:
1. Programming system configuration parameters (hardware and software, zone/circuit numbers, communication parameters).
2. Programming operational parameters such as opening/closing reports and windows, system response text (custom English) displays of events, activation of relays that drive auxiliary devices, and identifying types of zones/loops.
3. Programming passcodes according to the authorities and functions defined by the owner.
4. Other system programming tasks required by the owner. These additional programming requirements shall be coordinated between the owner and the contractor.

5. Operational Testing: The contractor shall perform thorough operational testing and verify that all system components are fully operational.
6. Hard-copy System Printout: The contractor shall submit a hard-copy system printout of all components tested and certify 100 percent operation indicating all devices/panels/units have passed the test criteria set forth by the manufacturer.
7. Acceptance Test Plan Form: An acceptance test plan form shall be prepared/ provided by the contractor prior to the acceptance walk-through.
8. This form shall include separate sections for each device/panel/unit as well as a column indicating the manufacturer's performance allowance/margin, a column indicating the result of the testing performed by the contractor (pass/fail), and an warrantee column for recording The manufacturers warrantee one the particular piece of equipment.
9. Fire Alarm Systems shall comply with NFPA 72 Standards for inspection, testing, and maintenance.

J. The contractor shall certify completion in writing and schedule the commissioning walk-through. The contractor shall provide all the tools and personnel needed to conduct an efficient commissioning process.

3.2 FIELD QUALITY CONTROL

A. Installation contractor shall submit a written test report that the system has been 100 percent tested and approved. Final test shall be witnessed by the owner, engineer, electrical contractor, chief security officer, and performed by the installation contractor. Final test report shall be received and acknowledged by the owner prior to request for final payment.

B. Provide instruction to the owner's satisfaction with regard to proper use and operation of the system.

C. Determine and report all problems to the manufacturer's customer service department.

3.3 ADJUSTING

A. System maintenance and repair of system or workmanship defects during the warranty period shall be provided by the Contractor free of charge (parts and labor).

B. Periodic testing of the system shall be carried out on a monthly or quarterly basis to ensure the integrity of the control panel, the sensing devices, and the telephone lines.

C. The installer shall correct any system defect within six hours of receipt of call from the Owner.

3.4 DEMONSTRATION

A. Demonstrate at final inspection that surveillance system and devices functions properly.
1. The Contractor upon completion of installation shall furnish training in the complete operation of the systems. A minimum of 4 hours shall be provided for this training.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before substantial completion.

3.6 A. SECURITY DEVISES TO BE FURNISHED:

Bosch D9412GV4 control panel
Bosch D7412GV4 control panel
D1260 Keypads, Black
D9210C Access Module, each panel
B308 SDI2 bus relay module
B208 SDI2 bus input modules as needed
D9127T Popit module as needed
D8125 Popex zone expander, as needed for one in each panel
D101 Lock and Key
D110 Tamper switches
D8103 Enclosure as needed
D9131A Printer module
Blue Line Series Motion Detectors, Tri-Tech only as needed
EK-150RT out door sirens,. Stainless Steel
D56 Command Center Box as needed
DS1102i Glass break detectors
ISN-CMET-200AR Door Contact
INS-CMET-4481 Overhead garage door contacts
12vdc, 7amp batteries

SL401C Strobe Lights
1078CBR Door Contacts
USP-A1 Window Contacts
25751 Control Cable
25222 Contact Cable
One lot of Misc. mounting hardware.
Any products not listed for a complete system
USB-1A Panic Contacts
Caddy wire mounting devices.

Any products not listed SHALL BE INCLUDED for a complete system

AT NO TIME DURING REWIRE, INSTALATION OF NEW DEVICES AND PANEL/CENTRAL STATION SHALL THE FACILITY BE WITHOUT 24 HOUR ALARM PROTECTION.

PART ONE - GENERAL

1.1 SUMMARY

A. Section Includes

1. Digital Video Recorders and Analog Recording Devices.

1.2 REFERENCES

A. EMC USA

1. FCC Part 15, Class B

B. Canadian Standards Association (CSA)

1. CAN/CSA C22.2 No. 60950-1-03, 1st Edition, 2006-07

C. Environmental

1. RoHS compliant

D. International Organization for Standardization (ISO) (www.iso.ch)

1. ISO 9001 - Quality Management Systems.

E. Underwriters Laboratories, Inc. (UL).

1. UL 60950-1, 1st Edition, 2006-07-07 Information technology equipment

1.3 DEFINITIONS

A. H.264 (also known as MPEG4 Part 10): a powerful encoding format that compresses video much more effectively than older (MPEG4) standards. Recording video in H.264 format requires approximately 30% less storage than traditional MPEG-4.

B. PTZ: refers to a movable camera that has the ability to pan left and right, tilt up and down, and zoom or magnify a scene.

C. CIF: stands for Common Intermediate Format which is a standard size for images produced by digital cameras and video cameras. CIF images are 352 pixels wide and 288/240 (PAL/NTSC) pixels tall (352 x 288/240).

D. 4CIF: resolution is four (4) times greater than that of CIF images, or 704 pixels wide and 576/480 (PAL/NTSC) pixels tall (704 x 576/480).

1.4 SYSTEM DESCRIPTION

A. Digital Video Recorders and Analog Recording Devices.

1. Digital Video Recorder

B. Performance Requirements

1. Fully integrated, stand-alone video recording management solution in a compact design.
2. [Optional integrated DVD writer.]
3. [Record up to eight looped-through, auto-terminating camera inputs using high resolution H.264 video compression.]
4. [Record up to sixteen looped-through, auto-terminating camera inputs using high resolution H.264 video compression.]
5. View recorded video in CIF, 2CIF, or 4CIF/D1 resolution.
6. Support VGA 16:9, 16:10, and 4:3 aspect ratios in various resolutions.
7. Provide system wide recording, monitoring, and management for Bosch and third-party PTZ cameras.
8. Built-in web viewer for remote viewing, playback, control and configuration.
9. Multiple control options via USB mouse, front panel and remote control.
10. Remote configuration and management of devices on surveillance system.
11. Powerful search and playback functions.
12. Capable of delivering live video to mobile devices.
13. NTSC and PAL selectable video format (auto detected).
14. 10/100 Base-T Ethernet port for local or wide area network connection.
15. Stable embedded operating system.
16. Low maintenance.

1.5 SUBMITTALS

A. Product Data:

1. Manufacturer's data, operator and installation manuals software programs.

B. Shop Drawings; include

1. System device locations on architectural floor plans.

2. Full Schematic of system, including wiring information for all devices.

C. Closeout Submittals
1. User manual.
2. Parts list.
3. Connection diagram.
4. Installation CD.

1.6 QUALITY ASSURANCE

A. Manufacturer:
1. Minimum of [5] years' experience in manufacture and design of electronic security systems including sophisticated PC-based systems and digital products.

B. Manufacturer's quality system: Registered to ISO 9001:2000 Quality Standard. Installer: Minimum of [10] years' experience installing CCTV systems.

C. DELIVERY, STORAGE AND HANDLING

D. Deliver materials in manufacturer's original, unopened, undamaged packaging; and unharmed original identification labels.

E. Protect store materials from environmental and temperature conditions following manufacturer's instructions.

F. Handle and operate products and systems according to manufacturer's instructions for installation, environmental, mechanical or electrical requirements and within thermal stress limits.

G. Ensure conformance with operating limitations according to applicable data sheet.

1.7 WARRANTY

A. Provide manufacturer's warranty covering [3] years for CCTV products to repair and replace defective equipment.

B. Exchanges available for product failures.

1.9 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone or e-mail, or any time via Web.
1. Provide toll-free numbers to contact customer support.

C. Provide on-site training and on-line training via web.

PART 2 - CCTV PRODUCTS

2.1 MANUFACTURERS

A. Specified Base Bid Manufacturer:
Bosch Security Systems, Inc.

B. Substitutions:
1. Proposed substitutions must provide compliance documentation of substitution vs. specified products.

2.2 BOSCH DVR 650 SERIES - DVR-650-16A200

A. General Description:
1. The Video Recorder shall provide these features:
a. Fully integrated, stand-alone video recording management solution in a compact design.
b. Optional integrated DVD writer.
c. Record up to eight looped-through, auto-terminating camera inputs using high resolution H.264 video compression.
d. Record up to sixteen looped-through, auto-terminating camera inputs using high resolution H.264 video compression.
e. View recorded video in CIF, 2CIF, or 4CIF/D1 resolution.
f. Support VGA 16:9, 16:10, and 4:3 aspect ratios in various resolutions.
g. Provide system wide recording, monitoring, and management for Bosch and third-party PTZ cameras.
h. Built-in web viewer for remote viewing, playback, control and configuration.
i. Multiple control options via USB mouse, front panel and remote control.
j. Remote configuration and management of devices on surveillance system.
k. Powerful search functions that allow searches based on time/date stamps, motion or input triggers, and smart searches that allow searches on changes in

recorded video.
l. Powerful playback functions.
m. Capable of delivering live video to mobile devices.
n. NTSC and PAL selectable video format (auto detected).
o. 10/100 Base-T Ethernet port for local or wide area network connection.
p. Stable embedded operating system.
q. Low maintenance.

B. The Video Recorder shall feature H.264 video compression to reduce bandwidth and storage requirements.
C. The Video Recorder shall record automatically in the background.
D. The Video Recorder shall record at up to 25 (PAL) / 30 (NTSC) images per second, per channel at CIF resolution.
E. The Video Recorder shall be capable of recording at 2CIF and 4CIF resolution by reducing the recording image rate settings.
F. The Video Recorder shall be capable of displaying output on two monitors simultaneously.
G. The Video Recorder shall display VGA RGB video output in full-screen, quad, or multi-screen pictures that can be frozen or zoomed on one monitor.
H. The Video Recorder shall display VGA RGB video output in full-screen, quad, or multi-screen pictures on a second monitor.
I. The Video Recorder shall split recording archives into two partitions. Alarm recordings (input and motion) are stored on one partition, while continuous recordings are stored on a separate one.
J. The Video Recorder shall control pan/tilt/zoom (PTZ) equipment via RS?485 serial communications. The Video Recorder shall support these PTZ protocols:
1. Bosch OSRD (Biphase)
2. Pelco P and D
K. The Video Recorder shall support connection to the Bosch IntuiKey keyboard that allows loop through connections to control 16 DVR 630/650 recorders from a single keyboard.
L. The Video Recorder shall contain alarm handling functions and telemetry control. The alarm functions shall include Motion detection in user-definable areas on any camera input.
M. The Video Recorder shall be operated and programmed via the onscreen display menu system using the front panel control keys, the mouse or the remote control.
N. The Video Recorder shall provide two monitor outputs to provide full-screen, quad (main monitor only), and sequenced viewing.
O. The Video Recorder shall provide the Control Center PC software or a built-in web application via a network for live viewing, playback, and configuration. The Control Center shall also support other Bosch products including the Divar MR, 400 Series and the 700 Series. The Control Center shall allow four users to control the 630/650 Series simultaneously.
P. The Video Recorder shall include an authenticity check for both local and remote playback.
Q. The Video Recorder shall allow local archiving via a USB device or via an optional built-in DVD burner.
R. The Video Recorder shall offer email notifications that contain 10-second video clips.
S. The Video Recorder shall support Real Time Streaming Protocol (RTSP) to deliver live video over the Internet to an appropriate mobile device. (The video recorder has been tested and works with the following mobile devices: iPhone, BlackBerry and HTC smart phones.)
T. The Video Recorder shall support a remote DVR viewer app for Apple iOS devices.
U. Video Recorder Specifications:
1. Rated Voltage and Power
a. External Power Adapter
1) AC Input: 110-240 VAC, 50/60 Hz; 1.8 A
2) DC Input: 12 VDC, 5 A
b. DVR Power Input: 12 VDC; 3.5 A; 145 BTU/h
2. Video Inputs
a. Inputs: Composite video 1 Vpp, 75 ohm, automatic termination; PAL/NTSC auto-detect
b. AGC: Automatic gain adjustments for each video input
3. Video Outputs

a. Outputs:
    1) Monitor A: VGA RGB
    2) Monitor B: VGA RGB
b. Live Resolution (Mon A.): 800 x 600 (4:3), 1024 x 768 (4:3), 1280 x 1024 (5:4), 1366 x 768 (16:9), 1440 x 900 (16:10)
c. Digital Zoom: 2 times
d. Streaming Video: H.264 compression

4. Audio
    a. Inputs: Mono RCA, 1.0 Vpp
    b. Output: Mono RCA, 1.0 Vpp
    c. Compression: ADPCM
    d. Sample Rate: 16 kHz per channel
    e. Bit Rate: 8-bit
5. Alarm Handling
    a. Inputs: 8 or 16 inputs configurable NO/NC, max. input voltage 15 VDC
    b. Outputs: 4 Relay outputs, configurable NO/NC, max. rated 30 VAC, 40 VDC 0.5 A continuous or 10 VA
6. Control
    a. RS485: Output signals according to RS485, max. signal voltage -8 to +12 V
    b. RS485 Support: Bosch domes, and Pelco P and D
7. Connectors
    a. Video Inputs: 8 or 16 looping BNC, auto termination
    b. Monitor: 2 VGA D-SUB
    c. Alarm Connectors: Screw terminal inputs, cable diameter AWG26?16 (0.13-1.5 mm)
    d. Audio Inputs: 4 RCA (CINCH)
    e. Audio Output: 2 RCA (CINCH)
    f. Ethernet: RJ45, 10/100 BaseT according to IEEE802.3
    g. RS485: Screw terminal output, cable diameter AWG28?16 (0.08-1.5 mm)
    h. USB 2.0: One front and one rear USB connector for mouse or USB memory device
8. Storage
    a. Hard Disks: 2 SATA hard drive maximum 2TB each (field replaceable)
9. Video Recording
    a. Record Rates
        1) NTSC: Max. 30 IPS per channel, configurable: 30, 15, 7.5, 5, 3, 1
        2) PAL: Max. 25 IPS per channel, configurable: 25, 12.5, 6.25, 5, 2.5, 1
    b. Recording Quality: Best, High, Normal, Low, Lowest
    c. Average Recording Capacity (16 channels, 500 GB)
        1) PAL
            a) CIF, Normal, 25 IPS: 138 hours
            b) CIF, Normal, 6.25 IPS: 350 hours
            c) 2CIF, Normal, 12.5 IPS: 115 hours
            d) 4CIF, Normal, 6.25 IPS: 93 hours
        2) NTSC
            a) CIF, Normal, 30 IPS: 170 hours
            b) CIF, Normal, 7.5 IPS: 425 hours
            c) 2CIF, Normal, 15 IPS: 144 hours
            d) 4CIF, Normal, 7.5 IPS: 115 hours
    d. Maximum Recording Rates per Channel
        1) Local 16 Channels:
            a) 4CIF, PAL: 6 IPS
            b) 4CIF, NTSC: 7.5 IPS
            c) 2CIF, PAL: 12.5 IPS
            d) 2CIF, NTSC: 15 IPS
            e) CIF, PAL: 25 IPS
            f) CIF, NTSC: 30 IPS
        2) Local 8 Channels:
            a) 4CIF, PAL: 12.5 IPS

b) 4CIF, NTSC: 15 IPS
c) 2CIF, PAL: 25 IPS
d) 2CIF, NTSC: 30 IPS
e) CIF, PAL: 25 IPS
f) CIF, NTSC: 30 IPS

3) Local 4 Channels:
a) 4CIF, PAL: 25 IPS
b) 4CIF, NTSC: 30 IPS
c) 2CIF, PAL: 25 IPS
d) 2CIF, NTSC: 30 IPS
e) CIF, PAL: 25 IPS
f) CIF, NTSC: 30 IPS

4) Remote (network) 16 Channels:
a) CIF, PAL: 6.75 IPS
b) CIF, NTSC: 7.5 IPS

5) Remote (network) 8 Channels:
a) CIF, PAL: 12.5 IPS
b) CIF, NTSC: 15 IPS

10. Display Modes
    a. Monitor A: Full, quad, multi-screen (live and playback), full sequence, alarm call-up (live)
    b. Monitor B: Full, quad, multi-screen, full sequence, alarm call-up (live)
11. Recording Modes
    a. Normal Partition: Continuous recording (with or without overwriting)
    b. Event Partition: Input and motion recording (with or without
12. Mechanical:
    a. Dimensions (WxDxH): 355 x 362 x 78 mm (13.9 x 14.2 x 3.1 in)
    b. Weight: 4.3 kg (9.46 lb) approx.
13. Environmental
    a. Operating Temperature: +0°C to +40°C (+32°F to +104°F)
    b. Storage Temperature: -40°C to +70°C (-40°F to +158°F)
    c. Operating Humidity: <93% non-condensing
    d. Storage Humidity: <95% non-condensing

PART 3 EXECUTION

A. EXAMINATION
1. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
2. Do not begin installation until unacceptable conditions are corrected.
3. Non-compliance with security instructions may result in loss of data.
4. Ensure environmental, mechanical and electrical requirements are met.

B. PREPARATION
1. Protect devices from damage during construction.

C. INSTALLATION
1. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
2. Perform installation with qualified service personnel.
3. Install devices in accordance with the National Electrical Code or applicable local codes.
4. Ensure selected location is secure and offers protection from accidental damage.
5. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

D. FIELD QUALITY CONTROL
1. Test proper operation of all video system devices.
    a. Communication between recorder and cameras.
    b. Independent operation of alarms, and cameras.
2. Test proper operation of software programs.
3. Determine and report all problems to the manufacturer's customer service department.

4. Determine and report all problems to the manufacturer's customer service department.

E. ADJUSTING

1. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
2. Make any adjustment of camera settings to comply with specific customer's need.

F. DEMONSTRATION

1. Demonstrate at final inspection that playback of video and storage functions operate properly.

VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS
BOSCH VDC-480V03-20 SERIES FLEXIDOME XF INDOOR CAMERAS

1.1 SUMMARY
- A. Section Includes
  1. Video Surveillance Remote Devices.

1.2 REFERENCES
- A. Canadian Standards Association (CSA)
  1. CSA 22.2 No. 950
- B. Federal Communications Commission (FCC) (www.fcc.gov)
  1. FCC CFR 47 part 15 class B - Telecommunications - Radio Frequency Devices - Digital Device Emission.
- C. International Organization for Standardization (ISO)
  1. 9001 - Quality System.
- D. Underwriters Laboratories, Inc. (UL) (www.ul.com)
  1. UL 1950 Standard for Information Technology Equipment Including Electrical Business Equipment

1.3 DEFINITIONS
- A. Automatic Gain Control (AGC): a process by which gain is automatically adjusted as a function of input or other specified parameter.
- B. Privacy Masking: The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.
- C. SensUp (sensitivity up): Increases camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s - PAL; 1/60 s to 1/6 s - NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.
- D. NightSense: A method of boosting the sensitivity of high-resolution Bosch color cameras by 9db (a factor of 3) by combining the signal of the color image in a single monochrome picture.

1.4 SYSTEM DESCRIPTION
- A. Video Surveillance Remote Devices
  1. VDC-480 Series Dome Cameras FlexiDome XF Indoor Cameras
- B. Performance Requirements
  1. 15-bit DSP image processing technology.
  2. 1/3 inch Interline CCD sensor.
  3. XF-Dynamic for wide dynamic range.
  4. Indoor polycarbonate dome.
  5. Dome shape for 90° vertical view.

1.5 SUBMITTALS
- A. Product Data:
  1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
- B. Shop Drawings; include
  1. System device locations on architectural floor plans.
  2. Full Schematic of system, including wiring information for all devices.
- C. Closeout Submittals
  1. User manual.
  2. Parts list.
  3. System device locations on architectural floor plans.
  4. Wiring and connection diagram.
  5. Maintenance requirements.

1.6 QUALITY ASSURANCE
- A. Manufacturer:
  1. Minimum of [10] years' experience in manufacture and design Video Surveillance Devices.
  2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.
- B. Video Surveillance System

1. Listed by [UL] [EN] [FCC] specifically for the required loads. Provide evidence of compliance upon request.

C. Installer:

1. Minimum of [10] years' experience installing Video IP Surveillance System.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.

B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.

C. Handle and operate products and systems according to manufacturer's instructions.

D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.8 WARRANTY

A. Provide manufacturer's warranty covering 3 years for replacement and repair of defective equipment.

1.9 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Specified Base Bid Manufacturer:
Bosch Security Systems, Inc.

B. Substitutions:

1. Proposed substitutions must provide compliance documentation of substitution vs. specified products.

2.2 BOSCH VDC-480 SERIES FLEXIDOME XF INDOOR CAMERAS VDC-480V03-20

A. General Characteristics:

1. Incorporate Bosch 15-bit digital signal processing and XF-dynamic to optimize the contrast in the picture and provide a 32X extended dynamic range to maximize picture performance and sensitivity under all lighting conditions.
2. Utilize 1/3-inch interline CCD image sensor capable of producing up 540 TVL of resolution.
3. Provide a polycarbonate, clear dome bubble with a UV blocking antiscratch coating.
4. Provide a video motion detection function that provides four selectable sensitivity areas. The motion detector function incorporates a global scene change detector to minimize false alarms caused by sudden changes in lighting conditions.
5. Produce a composite video signal, via a BNC connector, that allows a direct input to a conventional analog matrix switcher, DVR, or any standard analog CCTV video equipment.
6. Provide an on-screen display to simplify the camera/lens back focus and network configuration settings.
7. Provide a lens wizard during lens back focus setup to allow focusing at maximum lens opening to ensure that the object of interest within the field of view always remains in focus.
8. Provide a line-lock capability when powered by AC to synchronize the camera to the power line zero crossing for roll-free vertical interval switching. For vertical synchronization in multiphase power installations, the camera shall provide 0 to 358° of continuously adjustable vertical phase delay. Crystal-lock shall be selected when DC voltage is supplied or line-lock is switched off.
9. Provide a feature (SensUP) that enhances camera sensitivity by increasing the integration time on the CCD. This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.
10. Utilize XF-Dynamic technology to extend the dynamic range of the camera to provide a sharper image, simultaneously, in both the high-light and low-light areas of the scene.
11. Provide AutoBlack, Night Sense, and backlight compensation features.
12. Provide Bilinx technology to allow remote setup, control, and updates over the video

cable.

B. Installation Requirements
   1. Shall contain a full-featured camera and integral varifocal lens with automatic iris control.
   2. Shall be capable of being mounted to a surface, 4S (USA) electrical box, wall, corner, and suspended ceiling.
   3. Shall provide video and power connections on flying leads.
   4. Shall provide a multi-language on-screen display.

C. Electrical:
   1. Rated Voltage: 12 VDC or 24 VAC, 50/60 Hz
   2. Voltage Range: 10.8 to 39 VDC or 12 to 28 VAC, 45 to 65 Hz
   3. Power Consumption: 4 W
   4. Imager: 1/3-in. interline transfer CCD

D. Active Pixels:
   1. PAL: 752 x 582
   2. NTSC: 768 x 49

E. Sensitivity
   1. VDC-480V03
      a. Full Video (100 IRE)
         1) Color: 1.4 lx (0.13 fc)
         2) Color + 10x SensUP: 0.14 lx (0.013 fc)
         3) NightSense: 0.5 lx (0.046 fc)
         4) NightSense + 10x SensUP: 0.05 lx (0.0046 fc)
      b. Usable Picture (50 IRE):
         1) Color: 0.35 lx (0.033 fc)
         2) Color + 10x SensUP: 0.035 lx (0.0033 fc)
         3) NightSense: 0.13 lx (0.012 fc)
         4) NightSense + 10x SensUP: 0.013 lx (0.0012 fc)
      c. Usable Picture (30 IRE):
         1) Color: 0.16 lx (0.015 fc)
         2) Color + 10x SensUP: 0.016 lx (0.0015 fc)
         3) NightSense: 0.056 lx (0.0052 fc)
         4) NightSense + 10x SensUP: 0.0056 lx (0.00052 fc)
         5) Color: 0.62 lx (0.058 fc)
         6) Color + 10x SensUP: 0.062 lx (0.0058 fc)
         7) NightSense: 0.23 lx (0.021 fc)
         8) NightSense + 10x SensUP: 0.023 lx (0.0021 fc)
      d. Usable Picture (30 IRE):
         1) Color: 0.28 lx (0.027 fc)
         2) Color + 10x SensUP: 0.028 lx (0.0027 fc)
         3) NightSense: 0.099 lx (0.0092 fc)
         4) NightSense + 10x SensUP: 0.0099 lx (0.00092 fc)

F. Video
   1. Horizontal Resolution: 540 TVL
   2. Signal-to-Noise Ratio: >50 dB
   3. AGC: Auto, maximum level selectable 28 dB
   4. Video Output: Composite video 1 Vpp, 75 Ohm
   5. Dynamic Range: 32x dynamic range enhancement
   6. Sharpness Correction:
      a. Horizontal and vertical
      b. Symmetrical
   7. Synchronization:
      a. Internal
      b. Line Lock
   8. Electronic Shutter: Flickerless, on/off, default shutter
   9. White Balance:
      a. Automatic sensing (2500 to 9000K)
      b. AWB hold and manual
   10. Camera ID: 16-character editable string, position selectable

11. Remote Control: Bi-directional coaxial communication

G. Optical
1. Varifocal: Manual zoom and focus adjustment
2. Iris Control: Automatic Iris control
3. Viewing Angle (H x V):
a. 3 to 9.5 mm:

H. Mechanical:
1. Weight: 740 g (1.63 lb)
2. Mounting: Flush on hollow surface with three screws in a 4S electrical box
3. Color:
a. Trim ring: White (RAL91010)
b. Inner liner: Black
4. Adjustment range:
a. Pan: 360°
b. Tilt: 90°
c. Azimuth: ±90°
5. Construction:
a. Dome bubble: Polycarbonate, clear with UV blocking anti-scratch coating
b. Trim ring: Polycarbonate

I. Environmental:
1. Operating Temperature Range: -10º to 45ºC (-14º to 113ºF)
2. Storage Temperature Range: -40º to 70ºC (-40º to 158ºF)
3. Humidity: 5% to 93% relative humidity

2.3 ACCESSORIES

A. Mounts
1. VDA-455SMB Surface Mount
2. VDA-455WMT Wall Mounting Bracket
3. VDA-455CBL Clear Bubble

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.

B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

A. Protect devices from damage during construction.

3.3 INSTALLATION

A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.

B. Ensure selected location is secure and offers protection from accidental damage.

C. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

A. Test snugness of mounting screws of all installed equipment.

B. Test proper operation of all video system devices.

C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.

B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

A. Demonstrate at final inspection that video management system and devices function properly.

VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS
BOSCH VDC-480 SERIES FLEXIDOME XF INDOOR CAMERAS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Video Surveillance Remote Devices.

1.2 REFERENCES

A. Canadian Standards Association (CSA)

1. CSA 22.2 No. 950

B. Federal Communications Commission (FCC) (www.fcc.gov)

1. FCC CFR 47 part 15 class B - Telecommunications - Radio Frequency Devices - Digital Device Emission.

C. International Organization for Standardization (ISO)

1. 9001 - Quality System.

D. Underwriters Laboratories, Inc. (UL) (www.ul.com)

1. UL 1950 Standard for Information Technology Equipment Including Electrical Business Equipment

1.3 DEFINITIONS

A. Automatic Gain Control (AGC): a process by which gain is automatically adjusted as a function of input or other specified parameter.

B. Privacy Masking: The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.

C. SensUp (sensitivity up): Increases camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s - PAL; 1/60 s to 1/6 s - NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.

D. NightSense: A method of boosting the sensitivity of high-resolution Bosch color cameras by 9db (a factor of 3) by combining the signal of the color image in a single monochrome picture.

1.4 SYSTEM DESCRIPTION

A. Video Surveillance Remote Devices

1. VDC-480 Series Dome Cameras FlexiDome XF Indoor Cameras

B. Performance Requirements

1. 15-bit DSP image processing technology.
2. 1/3 inch Interline CCD sensor.
3. XF-Dynamic for wide dynamic range.
4. Indoor polycarbonate dome.
5. Dome shape for 90° vertical view.

1.5 SUBMITTALS

A. Submit under provisions of submittals section of Division One of the specifications

B. Product Data:

1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.

C. Shop Drawings; include

1. System device locations on architectural floor plans.
2. Full Schematic of system, including wiring information for all devices.

D. Closeout Submittals

1. User manual.
2. Parts list.
3. System device locations on architectural floor plans.
4. Wiring and connection diagram.
5. Maintenance requirements.

1.6 QUALITY ASSURANCE

A. Manufacturer:

1. Minimum of [10] years' experience in manufacture and design Video Surveillance Devices.
2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.

B. Video Surveillance System
1. Listed by [UL] [EN] [FCC] specifically for the required loads. Provide evidence of compliance upon request.

C. Installer:
1. Minimum of [10] years' experience installing Video IP Surveillance System.

1.7 DELIVERY, STORAGE AND HANDLING

A. Comply with requirements of Division One of the specifications

B. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.

C. Protect store materials from environmental and temperature conditions following manufacturer's instructions.

D. Handle and operate products and systems according to manufacturer's instructions.

E. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.8 WARRANTY

A. Provide manufacturer's warranty covering [3] years for replacement and repair of defective equipment.

1.9 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Specified Base Bid Manufacturer:
Bosch Security Systems, Inc.

B. Substitutions:
1. Proposed substitutions must provide compliance documentation of substitution vs. specified products

2.2 BOSCH VDC-480 SERIES FLEXIDOME XF INDOOR CAMERAS VDC-480V03-20

A. General Characteristics:
1. Incorporate Bosch 15-bit digital signal processing and XF-dynamic to optimize the contrast in the picture and provide a 32X extended dynamic range to maximize picture performance and sensitivity under all lighting conditions.
2. Utilize 1/3-inch interline CCD image sensor capable of producing up 540 TVL of resolution.
3. Provide a polycarbonate, clear dome bubble with a UV blocking antiscratch coating.
4. Provide a video motion detection function that provides four selectable sensitivity areas. The motion detector function incorporates a global scene change detector to minimize false alarms caused by sudden changes in lighting conditions.
5. Produce a composite video signal, via a BNC connector, that allows a direct input to a conventional analog matrix switcher, DVR, or any standard analog CCTV video equipment.
6. Provide an on-screen display to simplify the camera/lens back focus and network configuration settings.
7. Provide a lens wizard during lens back focus setup to allow focusing at maximum lens opening to ensure that the object of interest within the field of view always remains in focus.
8. Provide a line-lock capability when powered by AC to synchronize the camera to the power line zero crossing for roll-free vertical interval switching. For vertical synchronization in multiphase power installations, the camera shall provide 0 to 358° of continuously adjustable vertical phase delay. Crystal-lock shall be selected when DC voltage is supplied or line-lock is switched off.
9. Provide a feature (SensUP) that enhances camera sensitivity by increasing the integration time on the CCD. This is accomplished by integrating the signal from a

number of consecutive video fields to reduce signal noise.
10. Utilize XF-Dynamic technology to extend the dynamic range of the camera to provide a sharper image, simultaneously, in both the high-light and low-light areas of the scene.
11. Provide AutoBlack, NightSense, and backlight compensation features.
12. Provide Bilinx technology to allow remote setup, control, and updates over the video cable.

B. Installation Requirements
1. Shall contain a full-featured camera and integral varifocal lens with automatic iris control.
2. Shall be capable of being mounted to a surface, 4S (USA) electrical box, wall, corner, and suspended ceiling.
3. Shall provide video and power connections on flying leads.
4. Shall provide a multi-language on-screen display.

C. Electrical:
1. Rated Voltage: 12 VDC or 24 VAC, 50/60 Hz
2. Voltage Range: 10.8 to 39 VDC or 12 to 28 VAC, 45 to 65 Hz
3. Power Consumption: 4 W
4. Imager: 1/3-in. interline transfer CCD

D. Active Pixels:
1. [PAL: 752 x 582]
2. [NTSC: 768 x 494]

E. Sensitivity
1. VDC-480V03
   a. Full Video (100 IRE)
      1) Color: 1.4 lx (0.13 fc)
      2) Color + 10x SensUP: 0.14 lx (0.013 fc)
      3) NightSense: 0.5 lx (0.046 fc)
      4) NightSense + 10x SensUP: 0.05 lx (0.0046 fc)
   b. Usable Picture (50 IRE):
      1) Color: 0.35 lx (0.033 fc)
      2) Color + 10x SensUP: 0.035 lx (0.0033 fc)
      3) NightSense: 0.13 lx (0.012 fc)
      4) NightSense + 10x SensUP: 0.013 lx (0.0012 fc)
   c. Usable Picture (30 IRE):
      1) Color: 0.16 lx (0.015 fc)
      2) Color + 10x SensUP: 0.016 lx (0.0015 fc)
      3) NightSense: 0.056 lx (0.0052 fc)
      4) NightSense + 10x SensUP: 0.0056 lx (0.00052 fc)
      5) Color: 0.62 lx (0.058 fc)
      6) Color + 10x SensUP: 0.062 lx (0.0058 fc)
      7) NightSense: 0.23 lx (0.021 fc)
      8) NightSense + 10x SensUP: 0.023 lx (0.0021 fc)
   d. Usable Picture (30 IRE):
      1) Color: 0.28 lx (0.027 fc)
      2) Color + 10x SensUP: 0.028 lx (0.0027 fc)
      3) NightSense: 0.099 lx (0.0092 fc)
   4) NightSense + 10x SensUP: 0.0099 lx (0.00092 fc)

F. Video
1. Horizontal Resolution: 540 TVL
2. Signal-to-Noise Ratio: >50 dB
3. AGC: Auto, maximum level selectable 28 dB
4. Video Output: Composite video 1 Vpp, 75 Ohm
5. Dynamic Range: 32x dynamic range enhancement
6. Sharpness Correction:
   a. Horizontal and vertical
   b. Symmetrical
7. Synchronization:
   a. Internal

b. Line Lock
8. Electronic Shutter: Flickerless, on/off, default shutter
9. White Balance:
a. Automatic sensing (2500 to 9000K)
b. AWB hold and manual
10. Camera ID: 16-character editable string, position selectable
11. Remote Control: Bi-directional coaxial communication

G. Optical
1. Varifocal: Manual zoom and focus adjustment
2. Iris Control: Automatic Iris control
3. Viewing Angle (H x V):
a. 3 to 9.5 mm:

H. Mechanical:
1. Weight: 740 g (1.63 lb)
2. Mounting: Flush on hollow surface with three screws in a 4S electrical box
3. Color:
a. Trim ring: White (RAL91010)
b. Inner liner: Black
4. Adjustment range:
a. Pan: 360°
b. Tilt: 90°
c. Azimuth: ±90°
5. Construction:
a. Dome bubble: Polycarbonate, clear with UV blocking anti-scratch coating
b. Trim ring: Polycarbonate

I. Environmental:
1. Operating Temperature Range: -10º to 45ºC (-14º to 113ºF)
2. Storage Temperature Range: -40º to 70ºC (-40º to 158ºF)
3. Humidity: 5% to 93% relative humidity

2.3 ACCESSORIES
A. Mounts
1. VDA-455SMB Surface Mount
2. VDA-455WMT Wall Mounting Bracket
3. VDA-455CBL Clear Bubble

PART 3 - EXECUTION
3.1 EXAMINATION
A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION
A. Protect devices from damage during construction.

3.3 INSTALLATION
A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
B. Ensure selected location is secure and offers protection from accidental damage.
C. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL
A. Test snugness of mounting screws of all installed equipment.
B. Test proper operation of all video system devices.
C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING
A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION
A Demonstrate at final inspection that video management system and devices function properly.

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Video Surveillance Remote Devices.

1.2 REFERENCES

A. Canadian Standards Association (CSA)

1. CSA 22.2 No. 950

B. European Norm

1. EN 50102, exceeding IK 10 - Protection Against Vandalism And Hostile Environments
2. EN 50130-4 (CE) Alarm Systems, Part 4 - Electromagnetic Compatibility - Product Family Standard: Immunity Requirements for Components of Fire, Intruder and Social Alarm Systems.
3. EN 50022 class B (CE) - Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement for Emission.
4. EN 60950 (CE) - Information technology equipment. Safety. General requirements

C. Federal Communications Commission (FCC) (www.fcc.gov)

1. FCC CFR 47 part 15 class B - Telecommunications - Radio Frequency Devices - Digital Device Emission.

D. International Electrotechnical Commission (IEC)

1. IEC 60068-2-75 test Eh, 50 J

E. International Organization for Standardization (ISO)

1. 9001 - Quality System.

F. Underwriters Laboratories, Inc. (UL) (www.ul.com)

1. UL 1950 Standard for Information Technology Equipment Including Electrical Business Equipment

G. Water/Dust Protection

1. IP 66
2. NEMA 4X

1.3 DEFINITIONS

A. Day/Night (infrared sensitive): A camera that has normal color operation in situations where there is sufficient illumination (day conditions), but where the sensitivity can be increased when there is little light available (night conditions). This is achieved by removing the infrared cut filter required for good color rendition. The sensitivity can be further enhanced by integrating a number of fields to improve the signal-to-noise ratio of the camera (this may introduce motion blur).

B. Privacy Masking: The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.

C. SensUP (sensitivity up): Increases camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s - PAL; 1/60 s to 1/6 s - NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.

D. Smart BLC (Back Light Compensation): Smart back-light compensation allows the camera to automatically compensate for bright areas of a high contrast scene without having to define a window or area.

1.4 SYSTEM DESCRIPTION

A. Video Surveillance Remote Devices

1. VDN-498 Series Flexidome Series 2X Dome Camera

B. Performance Requirements

1. 20-bit image processing technology.
2. CCD sensor with Wide Dynamic Range.
3. Dynamic engine with Smart BLC.

4. True Day/Night performance with switchable filter.
5. High-impact, vandal-resistant weatherproof housing.
6. Dome shape for 90° vertical view.

1.5 SUBMITTALS

A. Submit under provisions of Division One of the specifications
B. Product Data:
1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
C. Shop Drawings; include
1. System device locations on architectural floor plans.
2. Full Schematic of system, including wiring information for all devices.
D. Closeout Submittals
1. User manual.
2. Parts list.
3. System device locations on architectural floor plans.
4. Wiring and connection diagram.
5. Maintenance requirements.

1.6 QUALITY ASSURANCE
A. Manufacturer:
1. Minimum of [10] years experience in manufacture and design Video Surveillance Devices.
2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.
B. Video Surveillance System
1. Listed by [UL] [EN] [FCC] specifically for the required loads. Provide evidence of compliance upon request.
C. Installer:
1. Minimum of [5] years experience installing Video IP Surveillance System.

1.7 DELIVERY, STORAGE AND HANDLING
A. Comply with requirements of Division One of the specifictions.
B. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.
C. Protect store materials from environmental and temperature conditions following manufacturer's instructions.
D. Handle and operate products and systems according to manufacturer's instructions.
E. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.8 WARRANTY
A. Provide manufacturer's warranty covering [3] years for replacement and repair of defective equipment.

1.9 MAINTENANCE
A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Specified Base Bid Manufacturer:
Bosch Security Systems, Inc.
B. Substitutions:
1. Proposed substitutions must provide compliance documentation of substitution vs. specified products

2.2 BOSCH VDN-498 SERIES FLEXIDOME 2X DOME CAMERAS VDN-498V03-21S
A. General Characteristics:
1. High-impact, vandal-resistant, CCD camera with 20-bit digital signal processing (DSP).
2. Utilize 1/3-inch day/night CCD image sensor capable of producing up 540 TVL of resolution.
3. Provide protection against water and dust up to IP 66 (NEMA 4X) standards.
4. Provide a cast-aluminum housing, polycarbonate dome and hardened inner liner able to withstand the equivalent of 55 kg (120 lbs) of force.
5. Provide six distinct preprogrammed operational modes stored in the camera.
6. Provide a video motion detection function that provides one fully programmable area. The motion detector function incorporates a global scene change detector to minimize

false alarms caused by sudden changes in lighting conditions.

7. Provide four independent, fully programmable privacy mask areas.
8. Produce a composite video signal, via a BNC connector, that allows a direct input to a conventional analog matrix switcher, DVR, or any standard analog CCTV video equipment.
9. Provide an on-screen display to simplify the camera/lens back focus and network configuration settings.
10. Provide a lens wizard during lens back focus setup to allow focusing at maximum lens opening to ensure that the object of interest within the field of view always remains in focus.
11. Provide a feature (SensUP) that enhances camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s - PAL; 1/60 s to 1/6 s - NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.
12. Provide a frame integration mode (Bosch SensUp feature) that can produce a color image with a minimum scene illumination of 0.248 lux (0.023 fc) and a monochrome image, when in the night mode, with a minimum illumination of 0.1 lux (0.0093 fc).
13. Provide enhanced night viewing through the increase of IR sensitivity by automatically switching a motorized IR filter from color to monochrome operation in low-light or IR illuminated applications. Allow the IR filter to be switched manually via the alarm input, preprogrammed in a camera mode or profile.
14. Utilize XF-Dynamic technology to extend the dynamic range of the camera to provide a sharper image, simultaneously, in both the high-light and low-light areas of the scene.
15. Utilize 2X-Dynamic technology to extend the dynamic range of the camera to provide a sharper, more detailed image for increased accuracy in color reproduction in harsh lighting conditions.
16. Utilize SmartBLC technology to automatically compensate the image without compromising dynamic range.

B. Installation Requirements
   1. Shall contain a full-featured camera and integral varifocal lens.
   2. Shall be capable of indoor and outdoor installations.
   3. Shall be capable of being mounted to a surface, 4S (USA) electrical box, wall, corner, and suspended ceiling.
   4. Shall provide video and power connections on flying leads.
   5. Shall provide a built-in test pattern generator.
   6. Shall provide a multi-language on-screen display.

C. Alarm Handling Features:
   1. Provide an alarm input that may be triggered by either a normally opened or normally closed contact.
   2. Provide the capability on alarm to display up to a 31 character, programmable alarm message.
   3. Provide a relay output that may be selected for normally opened or normally closed operation. The relay can be activated from an external alarm input to the camera, manual activation from the browser, upon video motion detection, or video loss.

D. Electrical:
   1. Rated Voltage:
      a. [VDN-498V03-21S: 12 VDC ± 10% / 24 VAC ± 10%, 60 Hz]
   2. Power Consumption:
      a. 12 VDC: 400 mA
      b. 24 VAC: 350 mA
   3. CCD Type: 1/3-in. interline; WDR dual shutter

E. Active Pixels:
   1. [PAL: 752 x 582]
   2. [NTSC: 768 x 494]

F. Sensitivity
   1. VDN-498V03 (F1.2)
      a. Full Video (100 IRE)
         1) Color: 2.48 lx (0.23 fc)
         2) Color + SensUP 10 x: 0.248 lx (0.023 fc)

3) Monochrome: 1.01 lx (0.093 fc)
4) Monochrome + SensUP 10x: 0.1 lx (0.0093 fc)

b. Usable Picture (50 IRE):
1) Color: 0.621 lx (0.058 fc)
2) Color + SensUP 10 x: 0.062 lx (0.0058 fc)
3) Monochrome: 0.23 lx (0.021 fc)
4) Monochrome + SensUP 10x: 0.023 lx (0.0021 fc)

c. Usable Picture (30 IRE):
1) Color: 0.28 lx (0.027 fc)
2) Color + SensUP 10 x: 0.028 lx (0.0027 fc)
3) Monochrome: 0.099 lx (0.0092 fc)
4) Monochrome + SensUP 10x: 0.0099 lx (0.00092 fc)

2. VDN-498V06 (F1.6)
a. Full Video (100 IRE)
1) Color: 3.53 lx (0.356 fc)
2) Color + SensUP 10 x: 0.353 lx (0.035 fc)
3) Monochrome: 1.43 lx (0.144 fc)
4) Monochrome + SensUP 10x: 0.14 lx (0.014 fc)

b. Usable Picture (50 IRE):
1) Color: 0.90 lx (0.09 fc)
2) Color + SensUP 10 x: 0.09 lx (0.009 fc)
3) Monochrome: 0.35 lx (0.035 fc)
4) Monochrome + SensUP 10x: 0.03 lx (0.003 fc)

c. Usable Picture (30 IRE):
1) Color: 0.42 lx (0.042 fc)
2) Color + SensUP 10 x: 0.042 lx (0.0042 fc)
3) Monochrome: 0.14 lx (0.014 fc)
4) Monochrome + SensUP 10x: 0.014 lx (0.001 fc)

3. VDN-498V09 (F1.4)
a. Full Video (100 IRE)
1) Color: 2.7 lx (0.26 fc)
2) Color + SensUP 10 x: 0.27 lx (0.026 fc)
3) Monochrome: 1.1 lx (0.090 fc)
4) Monochrome + SensUP 10x: 0.11 lx (0.01 fc)

b. Usable Picture (50 IRE):
1) Color: 0.69 lx (0.064 fc)
2) Color + SensUP 10 x: 0.069 lx (0.0064 fc)
3) Monochrome: 0.27 lx (0.026 fc)
4) Monochrome + SensUP 10x: 0.027 lx (0.0026 fc)

c. Usable Picture (30 IRE):
1) Color: 0.321 lx (0.03 fc)
2) Color + SensUP 10 x: 0.032 lx (0.003 fc)
3) Monochrome: 0.11 lx (0.01 fc)
4) Monochrome + SensUP 10x: 0.011 lx (0.001 fc)

G. Video
1. Horizontal Resolution: 540 TVL
2. Signal-to-Noise Ratio: >50 dB
3. Video Output: Composite video 1 Vpp, 75 Ohm
4. Synchronization:
a. Internal
b. Line Lock
5. Shutter:
a. Auto (1/50 [1/60] to 1/10000) selectable
b. Auto (1/50 [1/60] to 1/150000) automatic flickerless, fixed selectable
6. White Balance:
a. ATW
b. ATW hold and manual (2500 to 10000K)

H. Optical
1. Varifocal: Manual zoom and focus adjustment

2. Iris Control: Automatic Iris control
3. Viewing Angle (H x V):
    a. 2.8 to 10 mm
        1) Wide 100.8° x 73.7°
        2) Tele: 28.5° x 21.4°
    b. 9 to 22 mm
        1) Wide 31.2° x 22.8°
        2) Tele: 12.8° x 9.6°
    c. 6 to 50
        1) Wide 43.4° x 32.4°
        2) Tele: 5.8° x 4.4°

I. Mechanical:
1. Weight: 740 g (1.63 lb.)
2. Mounting: Flush on hollow surface with three screws in a 4S electrical box
3. Color:
    a. Trim ring: White (RAL91010)
    b. Inner liner: Black
4. Adjustment range:
    a. Pan: 360°
    b. Tilt: 90°
    c. Azimuth: ±90°
5. Construction:
    a. Dome bubble: Polycarbonate, clear with UV blocking anti-scratch coating
    b. Trim ring: Aluminum

J. Environmental:
1. Operating Temperature Default (with heater off): -30º to 55ºC (-22º to 131ºF)
2. Operating Temperature (with heater on): -50º to 55ºC (-58º to 131ºF)
3. Storage Temperature Range: -55º to 70ºC (-67º to 158ºF)
4. Operating Humidity: 5% to 93% relative humidity
5. Storage Humidity: Up to 98% relative humidity
6. Impact Protection:
    a. IEC 60068-2-75 test Eh, 50 J
    b. EN 50102, exceeding IK 10
7. Water/Dust Protection: IP 66 and NEMA-4X

2.3 ACCESSORIES

A. Mounts
1. VDA-455SMB Surface Mount
2. VDA-455WMT Wall Mounting Bracket
3. VDA-455CMT Corner Mounting Bracket

2.4 ADDITIONAL EQUIPMENT

ALTV2416600UL Rack Mount Power Supply

ALTV2416600UL provides 24VAC or 28VAC distributed via sixteen (16) fuse protected outputs.

16 Fused Outputs CCTV Power Supply.

24VAC or 28VAC selectable output.
25 amp @ 24VAC (600VA) or 20 amp @ 28VAC (560VA) supply current.
Sixteen (16) fuse protected outputs.
Output fuses are rated @ 3.5 amp.
115VAC 50/60Hz, 5.4 amp input.
Surge suppression.
AC power LED indicator.
Illuminated Power Disconnect Circuit Breaker with manual reset.
Unit maintains camera synchronization.
Lifetime Warranty
UL listed for Commercial CCTV Equipment (UL2044)
CUL Listed - CSA Standard C22.2 No.1-98, Audio, Video and Similar Equipment
CE Approved

Middle Atlantic SBX-10 Wall Mount Rack for CCTV equipment.

Mount and supply power per owner specified location.

Monitor to be located on top of cabinet unless otherwise specified.
All Video and power supply connection shall terminate in this cabinet
All cable shall be prenatally labeled via a commercial DYMO label maker
On both cable ends. Numbering shall be associated with power supply and DVR equipment.

Power supply substitution will not be accepted.

USB-1A Panic Contacts
VDC-480V03-20 Camera
VDN-VDN-498V03-20 Camera
VDN-VDN-498V0603-21 Camera
PZM11LL Microphone
DVR-650-16A200 Digital video recorder
ALTV2416600UL Power Supply, rack mount.
E2211BN 22" desk top monitor CCTV
25357 Audio Cable.
Caddy wire mounting devices.
Appropriate State approved audio monitoring signage.
Middle Atlantic Rack SBX-10 with blank panels and associated hardware.
Siamese coaxial cable shall be West Penn 2518E

Any products not listed SHALL BE INCLUDED for a complete system

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

A. Protect devices from damage during construction.

3.3 INSTALLATION

A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
B. Ensure selected location is secure and offers protection from accidental damage.
C. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

A. Test snugness of mounting screws of all installed equipment.
B. Test proper operation of all video system devices.
C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

A. Demonstrate at final inspection that video management system and devices function properly.